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EXAMINER

VU, TUAN A

ART UNIT

PAPER NUMBER

2193

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Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|---------------------------|--|
| Office Action Summary | Application No. 09/731,678 | Applicant(s) DO ET AL. | |
| | Examiner Tuan A. Vu | Art Unit 2193 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 96-113 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 96-113 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is responsive to the Applicant's response filed 12/08/2005.

As indicated in Applicant's response, claims 1, 3-5, 17-51, 53-64, and 66-95 have been canceled, and claims 96-113 have been newly added. Claims 96-113 are pending in the office action.

Claim Objections

2. Claims 98 and 105 are objected to because of the following informalities

The limitation 'define parameter' (line 1-2, claim 98) appear to be a misprint, lest it would result in a lack of antecedent basis. It will be treated as 'design parameter'. Further, claim 105 recites 'allowing the user to defined ...' (line 4), the term 'defined' should also be corrected to make to become --define.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 96-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim et al., "Design of Software Systems based on Axiomatic Design", Robotics & Computer-Integrated Manufacturing, Vol. 8., MIT, 1991, pp. 243-255 (hereinafter Kim).

As per claim 96, Kim discloses a method of designing a software system, comprising:

Art Unit: 2193

defining a set of functional requirements that describe what the software system is to achieve (e.g. FRs – Fig. 1- pg. 244);

defining a set of design parameters, where each design parameter in the set satisfies at least one of the functional requirements (DPs – Fig. 1);

decomposing the set of functional requirements and design parameters to create hierarchy of functional requirements and a hierarchy of design parameters (e.g. Fig. 2, pg. 245; chp: *Hierarchical structuring and decomposition* – pg. 246), wherein at least one functional requirement of the set of functional requirements is a parent functional requirement at a first level in the hierarchy of functional requirements and is decomposed into at least two child functional requirements at a second level in the hierarchy that is below the first level, and wherein the at least two child functional requirements collectively accomplish the parent functional requirement (see FR1 → FR11, FR12 – Fig. 2;, *step 1: FRs → DPs*, right column, pg. 246);

defining a design matrix that maps each design parameter in the hierarchy of design parameters to the at least one functional requirement in the hierarchy of functional requirements that the respective design parameter satisfies (*step: 1 → step 6, 7*, pg. 246-248; Fig. 4); and

using the design matrix to define software modules (Fig. 5-6, pg. 249) of the software system, wherein at least one functional requirement in the hierarchy of functional requirements represents a software object of the software system (e.g. *Hierarchical structuring and decomposition* – pg. 246 – Note: *FR1, FR2 ... FR11, FR12* methods to implement the needs of library software system reads on software object modules; Fig. 7-8, pg. 249), and

wherein at least one design parameter in the hierarchy of design parameters represents an input to the software object (*step: 1 → step 6, 7, pg. 246-248; Fig. 10(b)* – Note: the DPs as hierarchized and equated with the FRs in order to define a relationship matrix reads on DP being input).

But Kim does not explicitly disclose that the FR-driven modules being designed from the matrix object are object-oriented structures. The concept of object-oriented and CASE tool have been considered known when Kim introduced the axiomatic approach; and Kim teaches decomposition of FR into software parent/child modules (see Introduction, L column, pg. 243; CASE – pg. 248; *child, parent* - see pg. 249, L column, i.e. suggestive of class inheritance) and matching of database-stored legacy of DPs or FRs to obtain libraries of software packages or modules that satisfy a axiomatic equation, such module-retrieving process not being dependent upon other existing modules in other layers of the hierarchy of FRs (pg. 253, L bottom to R column, top- i.e. suggestive of software reuse). Based on the concept of independently retrieving existing modules from previously stored FRs or DPs in conjunction with the parent/child organizing of the software modules from above, it would be obvious for one skill in the art at the time the invention was made to implement the modules associated with each FRs as intended by Kim, so that these modules being stored in existing libraries or legacy database be reuse object-oriented classes or packages, because the creation of OO instances as they are retrieved from reuse can support the non-dependency of module being fetched in Kim's process as purported in the axiomatic matching as set forth above, thus alleviating resources usage via reuse of pre-stored objects.

As per claim 97, Kim discloses that at least one element of the design matrix and the at least one design parameter represents an operation performed by the software object (see *FRx*, *DPx* - equations 7-12, pp. 246-248, 250-251).

As per claim 98, Kim discloses that wherein the act of defining the set of define parameters further comprises determining the set of design parameters by mapping the set of functional requirements into a physical implementation domain (e.g. *physical domain* – pg. 251, R column).

As per claims 99-100, Kim discloses an act of determining if the design matrix is decoupled (eq. 11, pg. 250); and is not decoupled, manipulating the design matrix into lower triangular form (e.g. pg. 249, L column; eq. 11, pg. 250).

As per claim 101, Kim discloses wherein the at least one functional requirement that represents a software object includes at least two functional requirements, and wherein a first of the at least two functional requirements represents a first software object and a second of the at least two functional requirements represents a second software object (e.g. Fig. 2, 4, 5, pg. 245, 247, 248, respectively).

As per claim 102, Kim discloses defining a relationship between the first software object and the second software object using a junction (e.g. pg. 249, L column, Fig. 7).

As per claim 103, Kim discloses defining a third software object by combining the first software object and the second software object according to a type of the junction (e.g. *Summing Junction* - Fig. 7, pg. 249).

As per claim 104, Kim discloses wherein the type of the junction is one of: a summation junction; a control junction', or a feedback junction (e.g. pg. 249, L column; Fig. 7).

As per claim 105, Kim discloses computer readable medium encoded with instructions that, when executed on a computer system, perform a method of allowing a user to define a software system (e.g. *customer needs*, Fig. 1, pg. 254; *user needs* - L column, top, pg 246; *enable the designer to* – pg. 252, R column), the method comprising allowing the user to:

define (a set of functional requirements ...);

define (a set of design parameters);

decompose (the set of functional requirements and design parameters ...);

define (a design matrix that maps ...); and

using the design matrix (to define software modules...) as recited in claim 96.

Thus, all of which limitations are respectively addressed according to the rejection set forth in claim 96.

But Kim does not disclose that the software modules are to define an object-oriented structure. However, this limitation has been addressed as obvious in claim 96.

As per claims 106-113, these claims correspond to the claims 97-104 for reciting the same subject matter therein respectively; hence are rejected using the rationale set forth therein, correspondingly.

Response to Arguments

5. Applicant's arguments submitted 12/08/05 with respect to claims 1, 3-5, 17-51, 53-64, and 66-95, have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Art Unit: 2193

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan A Vu whose telephone number is (272) 272-3735. The examiner can normally be reached on 8AM-4:30PM/Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on (571)272-3719.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-3735 (for non-official correspondence – please consult Examiner before using) or 571-273-8300 (for official correspondence) or redirected to customer service at 571-272-3609.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: 571-272-2100.

Art Unit: 2193

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

VAT

February 8, 2006

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